Attack Helicopters in Theater Missile Defense Counterforce Operations

Major Jeff C. Alfier, US Air Force

But now I go, to find my dear friend's destroyer.
—Agamemnon, *The Iliad*

THROUGHOUT THE SPECTRUM of conflict, tactical ballistic missile (TBM) systems deployed by potential adversaries pose serious threats to US forces. Countering these threats is a joint mission accomplished through effective, interoperable battle management and command and control systems. The joint force commander integrates capabilities to destroy TBM target systems, their supporting infrastructures and TBMs in flight. This process is known as counter-force operations (CFOs), or "attack operations" and is one of the pillars of theater missile defense. This article concentrates on the role US Army attack aviation will play in destroying the often-elusive components of those systems.

Through experience in exercises and real-world operations, many have come to think of CFO in terms of fixed-wing tactical fighter aircraft armed with precision-guided munitions or area-denial weapons. Meanwhile, when we think of ground systems that may be brought to bear against TBMs, the Army Tactical Missile System quickly comes to mind. However, US Army attack aviation will also play an increasing role in CFOs.[1]

Depending on the situation, AH64D (Apache Longbow) attack helicopters may prove more tactically or operationally suited than fixed-wing aircraft to attack mobile TBM systems. For one, although mobile missile systems can disperse and obscure their locations in mountainous or rugged terrain or even urban hide sites, attack helicopters can exploit advantages of topography and multi-axis mobility to find and target them. Additionally, attack helicopters may benefit from forward arming and refueling points, allowing them rapid tactical replenishment in areas unsuited for fixed-wing aircraft.

Attack helicopter CFO missions may be deliberately executed against TBM locations in concert with preplanned fires and maneuver. Alternatively, they may be employed in search and attack missions when exact TBM system locations have not yet been refined by sensors such as UAVs or JSTARS.

Moreover, with their increasingly capable onboard systems and potential loiter times, attack helicopters could thoroughly search and attack suspected or known TBM operating areas in detail. With these considerations in mind, attack helicopter CFO missions may be deliberately executed against known TBM locations in concert with preplanned fires and maneuver. Alternatively, they may be employed in search and attack missions when exact TBM system locations have not yet been refined by sensors such as unmanned aerial vehicles (UAVs) or the Joint Surveillance Target Attack Radar System (JSTARS).

Capabilities and Methodology

Army attack helicopters have several salient capabilities to bring to bear against TBM systems. These features include day-night and adverse weather capability, survivability, heavy firepower options, state-of-the-art optics for target acquisition, high-resolution TV cameras, laser range finders and infrared for viewing thermal images. In addition, passive low-observable technology, forward-looking infrared radar, long-range sensors and large computer processing capability provide survivability and rapid data processing. Further, the AH-64D's fire control radar provides greater weapon accuracy and destruction at longer ranges than its predecessor.

Radar controllers aboard the E-8C (the airborne portion of JSTARS) could pass available TBM target data, weather, threats and other updates to attack helicopters en route to search areas. In sum, digitization technologies stretch lethality envelopes by enhancing the helicopter crews' situational understanding.

OH-58D Kiowa Warriors bring the same formidable firepower to the attack, incorporating data-link and video imagery into its advanced suite. Many of the improvements in weapons delivery come from the significant upgrades offered by the AH-64D, technologies which will also be exemplified in the forthcoming RH-66 Comanche.

The components associated with TBM target arrays are quite extensive: launch platforms, support equipment, facilities, personnel, command and control nodes, stockpiles and industrial facilities and infrastructures, including road networks, supporting the mobility and deployment of the actual missiles. Ideally, we should deal a catastrophic or mobility kill to these systems before they deploy for mobile combat operations.

While attacking tractor erector launchers (TELs) degrades or eliminates their ability to fire missiles, a target with potentially greater payoff is the TBM's reload site. Tracking the TEL from launch site to reload site offers the potential for destroying the original TEL, other TELs and the missiles, as well as the system's operators and maintainers. In best-case situations, there would be sufficient time for planning and preparing a deep attack, whether helicopters are dedicated through inclusion on the joint air tasking order, or diverted from another mission if they were already operating deep (beyond the Fire Support Coordination Line).[2] In any event, because of the elusive and explosive impact potential of TBMs, they are often designated "time-critical targets," requiring immediate prosecution to prevent them from threatening friendly forces and facilities.

If time does not permit a dedicated tasking, a hasty attack may be conducted with less extensive preparations, trading preparation time for speed to exploit an opportunity to attack the TBM element. Nevertheless, although deliberate and hasty attacks are possible against TBM systems, the Army views the search-and-attack method as the more probable.[3] As such, attack helicopters may find themselves in the situation to attack TBMs targets of opportunity during deep armed reconnaissance missions. In such cases they could function synergistically by providing valuable reconnaissance information of tactical or theater-level importance to commanders at all echelons.

Countermeasures: Natural and Man-Made

Of prime consideration is the fact that TBM forces would most likely operate in the enemy rear. During mission planning, attack helicopter pilots would use intelligence-based situation templates of TBM missile operating procedures overlaid on terrain modeling to refine their search areas. Planning considerations would include potential launch, reload and hide sites, the timeliness of launch detection, target location error and predicted TEL egress speeds and routes.[4] The S2 will help pilots with the topographical aspects of intelligence preparation. Moreover, TBM systems will likely fire their missiles, then move among hide, reload and new launch sites, complicating targeting. TBM systems have relatively short setup and tear-down times; therefore, communication links among sensor systems involved in detecting the TBM elements and the helicopter pilots will prove decisive. This intrinsically important factor comes into play since the TBM elements are difficult to detect until after they compromise their position by a launch and subsequent rapid dispersal, actions detectable by friendly sensors.[5] Yet, if TEL launch or hide sites can be denied in the first place, the enemy will be forced to make unwanted adaptations to their doctrine or plans, increasing the likelihood of their TBMs being detected while frustrating their commanders' courses of action (COAs).

Terrain is key when considering enemy COAs and countermeasures. For instance, TBMs operating out of urban terrain pose many unique problems for their attackers. Urban terrain provides the adversary with multidimensional vantage points, axes of attack and subsequent fields of fire. Desert regions make visual orientation of targets difficult, while decoys and camouflage, obscuring smoke, blowing sand and possibly smoke from oil fires can complicate visual and infrared identification.[6] Moreover, the hard-packed ground in many desert areas may allow TELs to bypass damaged or destroyed bridges, increasing TBM deployment or employment options.

Man-made countermeasures will also pose problems for those seeking to destroy mobile systems. Radar reflectors, intermittent light beacons and sophisticated use of flares present excellent countermeasures. Smoke generation can also screen electromagnetic radiation from on-board laser systems.[7] These types of countermeasures will apply in other terrain types, too, such as mountainous.

Terrain and countermeasures are not the only contending elements; weather also plays an obvious role. For instance, in desert environments on relatively calm and cloudless days, extended visibility can cause underestimation of distances, while mirages and heat shimmer also distort images during the day, although in high-threat environments, night operations are the norm. High winds can carry abrasive sand and dust, and man-made dust storms are raised by high-velocity, direct-fire weapons, wreaking havoc with visibility.

Technology shows promise for overcoming such difficulties. Through coordination with the Joint Surveillance Target Attack Radar System (JSTARS), helicopters could receive cross-cued target data from systems such as UAVs that would reduce the effects of such natural phenomena. Such emerging technologies will go a long way in countering enemy deception and countermeasures as helicopters become optimized for overcoming enemy use of terrain, camouflage and deception that currently frustrate our air- and space-borne sensor efforts.[8]

Advanced Technologies and Enhanced Situational Understanding Systems

The evolution of several situational awareness systems will enhance the attack helicopter's ability to identify, track and target TBM systems. These will include systems that transmit real-time intelligence data directly to pilots in the cockpit, systems which retransmit radar images of terrain and airborne relays for satellite-interactive networks to complete our picture of the battlespace.

Meanwhile, products gleaned from space-based warning sensors will pass TBM launch warnings to helicopter crews. Future satellite technologies will make detecting, tracking and attacking TBMs much easier. The Space-Based Infrared System satellite network will provide warning, track the TBM through burn-out and predict launch and initial impact points. Overall, space surveillance assets will enhance the tactical application of warning capabilities through improved sensor data processing to support the JFC's TMD efforts. For Army-specific needs, a space support team will bring satellite connectivity for multispectral imagery, weather, infrared intelligence, and 3-D displays of battlefield terrain features to the theater and incorporate time-critical data for TMD.

As mentioned above, the potential interaction between JSTARS and attack helicopters exemplifies further a potential for joint interoperability. While attack helicopters are engaged in search and attack, JSTARS' wide-area surveillance capability can track mobile TBM elements for target nomination. Radar controllers aboard the E-8C (the airborne portion of JSTARS) could pass available TBM target data, weather, threats and other updates to attack helicopters en route to search areas. In sum, digitization technologies stretch lethality envelopes by enhancing the helicopter crews' situational understanding. Strides in information and night-fighting capabilities are therefore critical to CFO missions.

When the 1991 Gulf War concluded, casualty tallies underscored the ominous fact that 25 percent of all American combat deaths were caused by the impact of a single Iraqi *Al-Husayn* TBM on a barracks at Dhahran, Saudi Arabia. Are Army attack helicopters the best possible platforms from which to strike such TBM systems? No. The best potential platforms would be fixed-wing aircraft delivering widely dispersed precision ordnance from standoff distances. However, US Army attack aviation is likely to become involved in CFO missions on tomorrow's fluid battlefields that will stress our diminishing combat resources. Under such circumstances, the attack helicopter unit may find that an enemy TBM system is part of a rogue state's strategic armament, as well as a main component of its battlefield arsenal, and that Army Aviation involvement in a CFO could make a major contribution to both the air-interdiction and strategic-attack campaigns. Hence, the mission effectiveness of US Army attack aviation will play a pivotal role in the entire theater campaign. ***MR***

NOTES

1. FM 1-100, *Army Aviation Operations* (Washington, DC: GPO, 21 Feb 97), 2-6.
2. The Air Tasking Order is the line-up of airpower assets for a given period in the air campaign execution. It is produced in the Air Operations Center by a joint planning team.
3. FM 1-112, I-1. In current times, the emerging doctrine of prosecuting TBM attacks results from AH-64 participation in ROVING SANDS 95', the advanced warfighting experiment held in the ranges near Ft Bliss, Texas.
4. FM 1-112, I-3.
5. FM 1-112, I-1.
6. Gulf War Air Power Survey, (Washington DC: GPO, 1992), 170-172.
7. For an interesting commentary on low-tech responses to high-tech systems see Lester W. Grau, "Blunting The Technological Edge: Bashing The Laser Range Finder With a Rock," *Military Review* (May-Jun 97).
8. 'Comanche RAH-66 Multi-Mission and More…', Boeing Sikorsky Joint Program Office, Philadelphia, PA (1996), 1.

Major Jeffrey C. Alfier, US Air Force, is the chief, Aerospace Control Division, 32d Air Operations Group, Ramstein Air Base, Germany. He received a B.A. from the University of Maryland and an M.A. from California State University. He has held various command and staff positions in the Continental United States and Europe, including chief, Airborne Command and Control System Plans, US Central Command Air Forces, Shaw Air Force Base, South Carolina; and chief, Training Tactics Development Section, Training Wing (NATO), and NATO AWACS evaluator (fighter locator), Geilenkirchen Air Base, Germany.